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35993-1

Operating and Service Manual

8 CH.

PREAMPLIFIER ASSEMBLY

892035

MP MASTER

MA34612

GOULD

An Electrical/Electronics Company

GOULD

MANUAL PART NO.
80-892035

8 CH.

PREAMPLIFIER ASSEMBLY

892035

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CURRENT EQUIPMENT:

The Gould Instruments Division's products as shown in the Current Equipment Catalog are warranted for a period of one year from date of shipment to original purchaser. They are warranted to conform to the applicable published specifications in effect at the time of shipment, and to be free from any defects in material or manufacture when used with recommended Gould associated equipment and Gould chart paper. LIABILITY OF THE GOULD INSTRUMENTS DIVISION UNDER SUCH WARRANTY IS LIMITED TO SERVICING OR REPLACING DEFECTIVE PARTS EXCEPT PENS, STYLI, FUSES AND BATTERIES AND DOES NOT INCLUDE CALIBRATION AND MINOR MAINTENANCE AS OUTLINED IN GOULD OPERATING MANUALS. (Exception: The thermal pen in the 110 Strip Chart Recorder is guaranteed for life.) IN NO EVENT SHALL THE GOULD INSTRUMENTS DIVISION BE LIABLE UNDER ANY CIRCUMSTANCES, FOR ANY LOSS OF PROFITS OR OTHER CONTINGENT, CONSEQUENTIAL OR SPECIAL DAMAGES. Units are to be returned transportation prepaid by the buyer. The Gould Instruments Division will have the right of final determination of the cause and existence of a defect under this warranty. This warranty shall not apply to any products which have been subjected to misuse, improper installation, repair, alteration, neglect, accident, inundation, fire or operation outside their published maximum ratings. THE FOREGOING WARRANTY IS EXCLUSIVE AND EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS AND OF ANY OTHER OBLIGATION AND SHALL CONSTITUTE THE SOLE REMEDY OF THE BUYER AND SOLE LIABILITY OF THE SELLER.

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If a defect occurs:

1. Notify your nearest ID Service Center (see below), giving full details of the difficulty, and include the model number, type number, and serial number. On receipt of this information, service data or shipping authorization and instructions will be forwarded to you.
2. On receipt of the shipping authorization, forward the instrument prepaid to location indicated on shipping authorization.

Compliance with the above procedure will assure the earliest repair and return of your equipment.

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SECTION I

GENERAL INFORMATION

1.1 INTRODUCTION

Gould Preamplifier Assembly 892035 (see Fig. 1-1) is a medium gain, eight channel unit. It will extend the measurement range of any eight channel, 50-division direct writing recorder, with ±2.5 volt sensitivity, from 1mv/chart division to 500 volts full scale. This amplifier is both electrically and mechanically compatible with any 2800 Series Gould recorder.

Each preamplifier channel has a 3-pin recessed male input connector with two active terminals and a common terminal. The active terminals are balanced to common and provide an input impedance of 5 megohms to common, or 10 megohms from terminal to terminal.

The low side or common point in each channel is direct connected from input to output and may be operated up to 250 volts dc off-ground provided the recorder or other readout device is compatible with this condition. The preamplifier may also be used with balanced-to-ground or single-ended-to-ground signal sources when the recorder pen drive amplifier or other readout device is operated floating or ungrounded. When the common point on any channel is grounded, the preamplifier presents a balanced-to-ground input configuration.

The output of each preamplifier channel is ±2.5 volts full scale into 5Kohms or greater. The output impedance is less than 100 ohms, which permits the preamplfier to be located up to several hundred feet from the recorder or other readout device if desired.

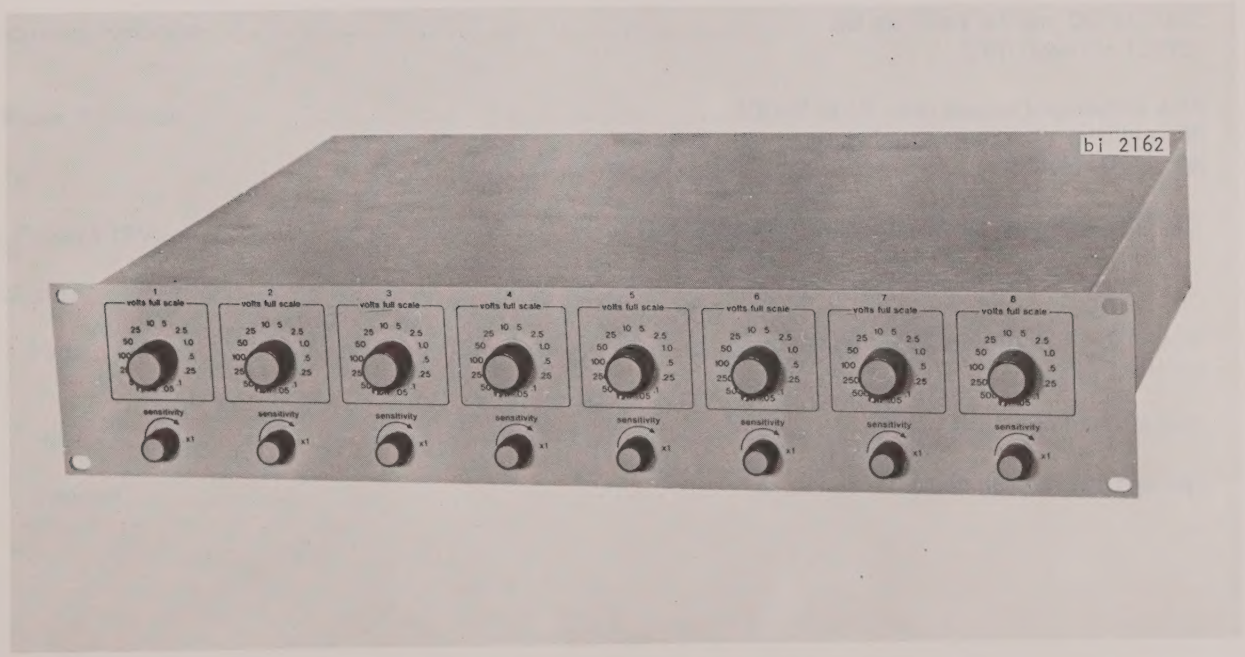


FIGURE 1-1 PREAMPLIFIER ASSEMBLY 892035

1.2 SPECIFICATIONS

Signal Input:

Circuit	Differential floating, balanced to common.
Impedance	10 megohms; balanced .5 megohms to guard.
Sensitivity	50 millivolts full scale, maximum.

Attenuators:

Function	Attenuation of signal voltage.
Inaccuracy	±1%.
Steps	13 steps. .05, .1, .25, .5, 1.0, 2.5, 5, 10, 25, 50, 100, 250, 500 Volts Full Scale and OFF.
Input Voltage	500 vdc or peak ac maximum.

Signal Output:

To Drive	±2.5 volts into 5Kohms or greater.
Noise	0.2 divisions maximum.
Linearity	±0.5% of full scale.

Frequency Response	50 divisions ±1 div. DC to 50HZ 3 dB down at 125Hz.
In-Phase Rejection	100dB @ 1K ohm source impedance with attenuator sensitivity setting at 50 millivolt full scale.
DC Power±15V	Obtained from Recorder Drive Amplifier 886220.

Controls:

Panel	Attenuator and sensitivity control with X1 position.
Rear	Access to balance pots
Internal	One balance pot per channel.

Environment:

Temperature:

Storage ..... -40° C to +85° C.

Operating ..... 0° C to +55° C (+32° F to 131° F)

Within Spec. ..... ±10° C from temp, at calibration.

Humidity ..... 95% at 32° C (90° F) (without condensation).

Vibration & Shock ..... Best commercial Practice.

1.3 ACCESSORIES

3 Pin Common Connector, female 234321
(Supplied with preamplifier)

SECTION II

INSTALLATION

2.1 GENERAL

This section provides installation and signal connections for the preamplifier assembly 892035.

2.2 INCOMING INSPECTION

Perform the following procedures before operating the preamplifier.

1. Visually inspect unit for damage that may have occurred during shipment. Refer to warranty sheet in case of damage.

2. Remove packing material and tape from preamplifier.

2.3 SIGNAL INPUT CONNECTIONS

Inputs should be made using the supplied shielded two-conductor cable. (Belden 8422 or equivalent). Input connectors (part number 234321) are to be wired as follows:

Signal High	Pin 1
Signal Low	Pin 2
Shield (guard)	Pin 3

2.4 POWER AND SIGNAL OUTPUT CONNECTION

Power and preamplifier output signals are connected to the recorder thru a harness assembly as shown in Figure 2-1. Harness cable ends are numbered for correct installation into the recorder.

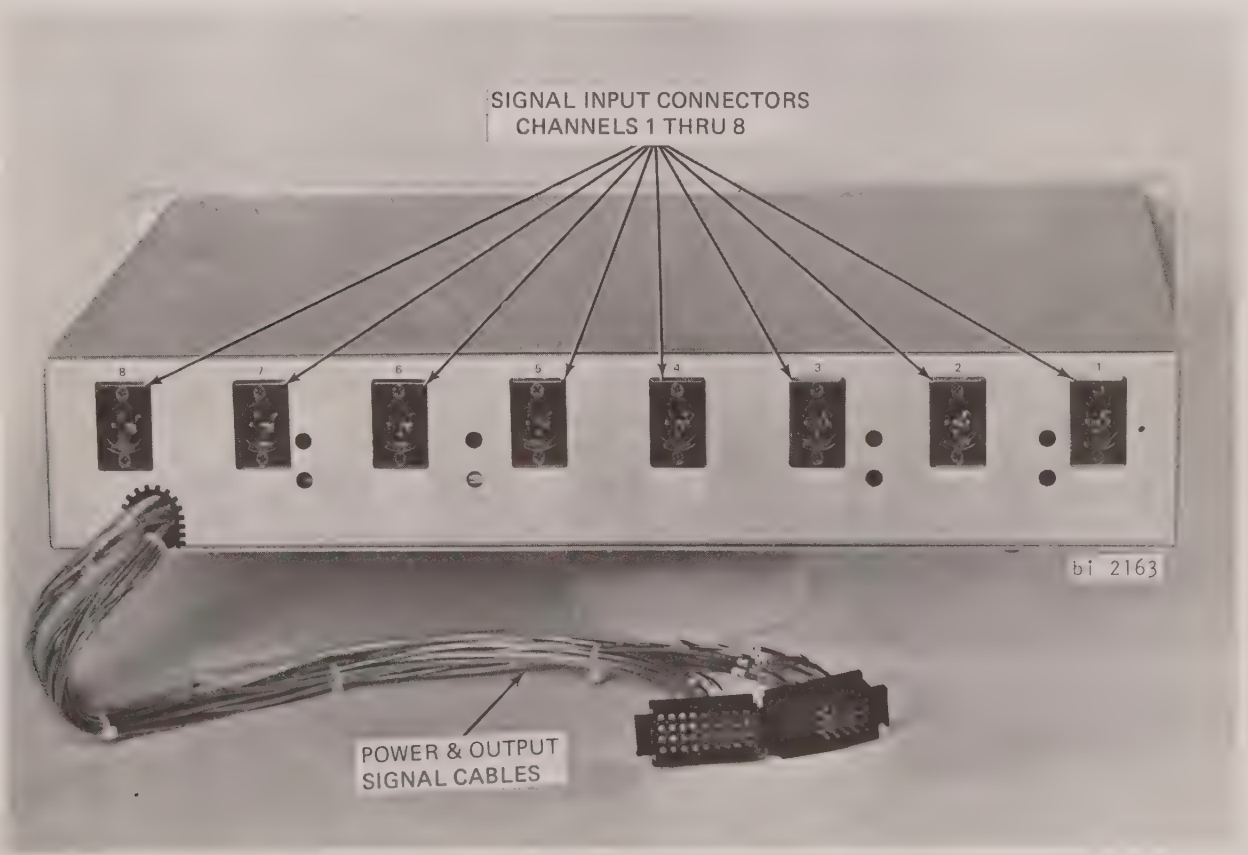


FIGURE 2-1 SIGNAL CONNECTIONS

SECTION III

OPERATION

3.1 GENERAL

This section describes and illustrates the controls necessary for operating the preamplifier, assembly 892035.

3.2 FRONT PANEL CONTROLS

CONTROLS	DESCRIPTION
VOLTS FULL SCALE	A 13 position rotary switch allows selection of .05, .1, .25, .5, 1.0, 2.5, 5, 10, 25, 50, 100, 250, 500 volts full scale for overall system sensitivity, and an OFF position.
SENSITIVITY X1	Provides intermediate sensitivities between the fixed settings of the VOLTS FULL SCALE control. When in the full clockwise (detent) position, the sensitivity is fixed as indicated on the VOLTS FULL SCALE control. When rotated counterclockwise, the sensitivity is less than indicated on stepped SENSITIVITY control to a maximum ratio of 2.5 to 1.

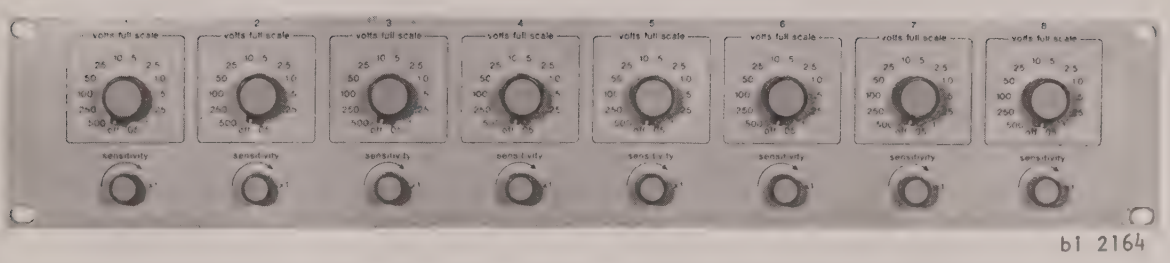


FIGURE 3-1 CONTROL DESCRIPTION

3.3 PRELIMINARY OPERATION

1. Check to insure that proper cable connections between preamplifier and recorder have been completed.

2. Check to insure that signal input cables are attached per Paragraph 2.3.

3. Volts Full Scale switch in OFF position.

4. Rotate SENSITIVITY vernier control fully clockwise to detent position.

3.4 OPERATIONAL CHECK

1. Place oscillograph in operation per oscillograph instruction manual.

2. Apply known D.C. voltage to preamplifier input, and increase Volts Full Scale attenuator setting to obtain full scale pen deflection on chart paper. Pen deflection should equal attenuator setting.

3. Repeat step 2 for remaining channels.

4. Remove input signals from preamplifier.

5. Place all Volts Full Scale controls in OFF position.

6. Units is now ready for operation.

SECTION IV

CALIBRATION

4.1 GENERAL

This section describes and illustrates the procedures for calibrating the preamplifier. One channel was selected, repeat procedures for other channels.

The following calibration procedure was written with the assumption that the oscillograph has been checked out and calibrated per its appropriate procedure.

4.2 TEST EQUIPMENT REQUIRED

Below is a list of test equipment necessary for calibration.

NOTE: Specific manufacture need not be adhered to, but comparable equipment is mandatory since accuracy stated is important.

a. Digital Voltmeter – Fluke Model 8300.

b. Function Generator (Wavetek Model 110 or equivalent)

c. Oscillograph – 2800 or equivalent.

NOTE: All preamplifier commons are isolated from each other and chassis ground.

4.3 CALIBRATION

a. Preliminary Procedures

WARNING: BE SURE SYSTEM POWER CABLE IS DISCONNECTED.

1. Remove 4 screws from the front of the preamplifier assembly.

2. Disconnect rear connector between preamplifier and recorder. Pull from connector body, not from harness.

3. Slide preamplifier out from front of case. Push from rear and/or pull from side corners.

4. Remove 9 screws and remove preamplifier top to gain access to adjustment controls. Figure 4-1.

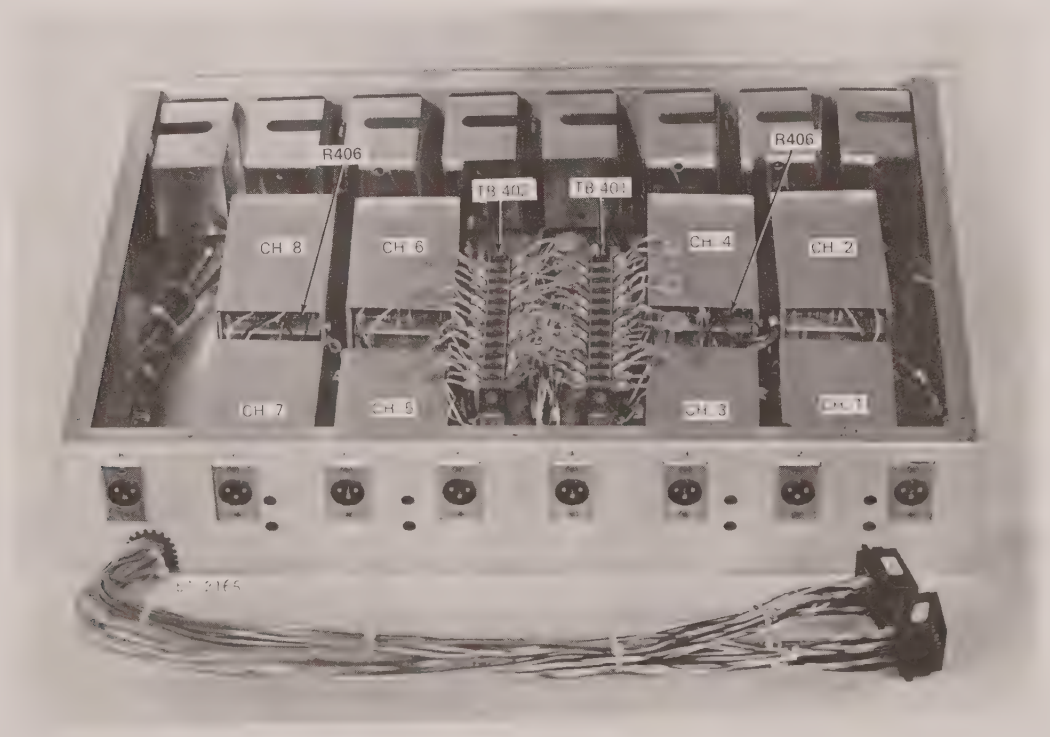


FIGURE 4-1 PREAMPLIFIER ADJUSTMENT

5. Slide recorder out from rack and reconnect the rear power and output connector from the preamplifier.

b. Preamp Power Check

1. Connect oscillograph to ac power line.
2. Depress power pushbutton.
3. Chart speed pushbuttons should be in "STOP" position.
4. Using a DVM check the individual preamp voltage for ±15 volts ±10% for all 8 channels on TB-401 & TB-402 Figure 4-2.

c. Span Adjustment (Recorder)

1. Set attenuator to the 50mv/full scale position. With chart running, apply .050 volts ±0.05mv to the preamplifer input.
2. Adjust the span control, on the recorder drive amplifier 886220, for full scale deflection ±.2 div.

d. Balance Adjustment (Preamp)

1. Operate oscillograph at 1MM/SEC chart speed.
2. Set preamplifier ATTENUATOR control in OFF position.
3. Rotate the preamplifier SENSITIVITY X1 control from maximum clockwise to maximum counterclockwise.
4. Adjust preamplifier balance resistor, R-406 (see Fig. 4-1) for pen movement of less than 0.1 division.

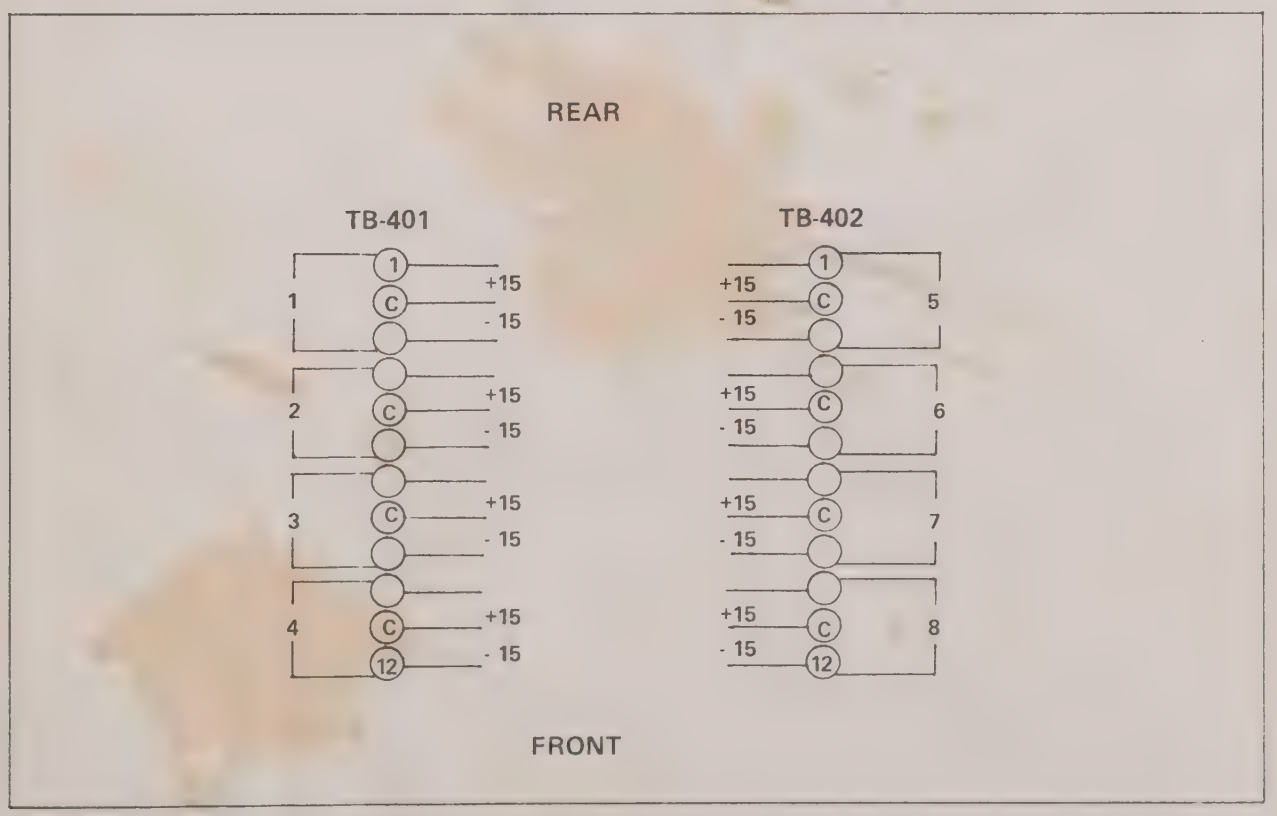


FIGURE 4-2 TEST DIAGRAM

SECTION V

THEORY OF OPERATION

5.1 GENERAL

Preamplifier assembly 892035 (Fig. 5-1) consists of eight plug-in amplifier assemblies whose power for operation is obtained from the accompanying recorder drive amplifier. Attenuation of the input signal is accomplished by the Volts Full Scale switch and sensitivity control on the front panel.

5.2 DETAILED DESCRIPTION

Input signals are applied to the balanced attenuator network consisting of resistors R-101 thru R-126. The differential input signal from the attenuator network is applied to the input of the preamplifier module, AR-401, thru protective resistors, R-401 and R-402.

With the variable SENSITIVITY control (R-410/S-410) in the detent (X1) position, the preamplifier assembly operates at a gain of 100 which is set by resistor, R-403. The variable SENSITIVITY control places a portion of resistor, R-403, and varies the gain down to 40. The single-ended output of the preamplifier assembly is applied to the drive amplifier thru the limiter circuit.

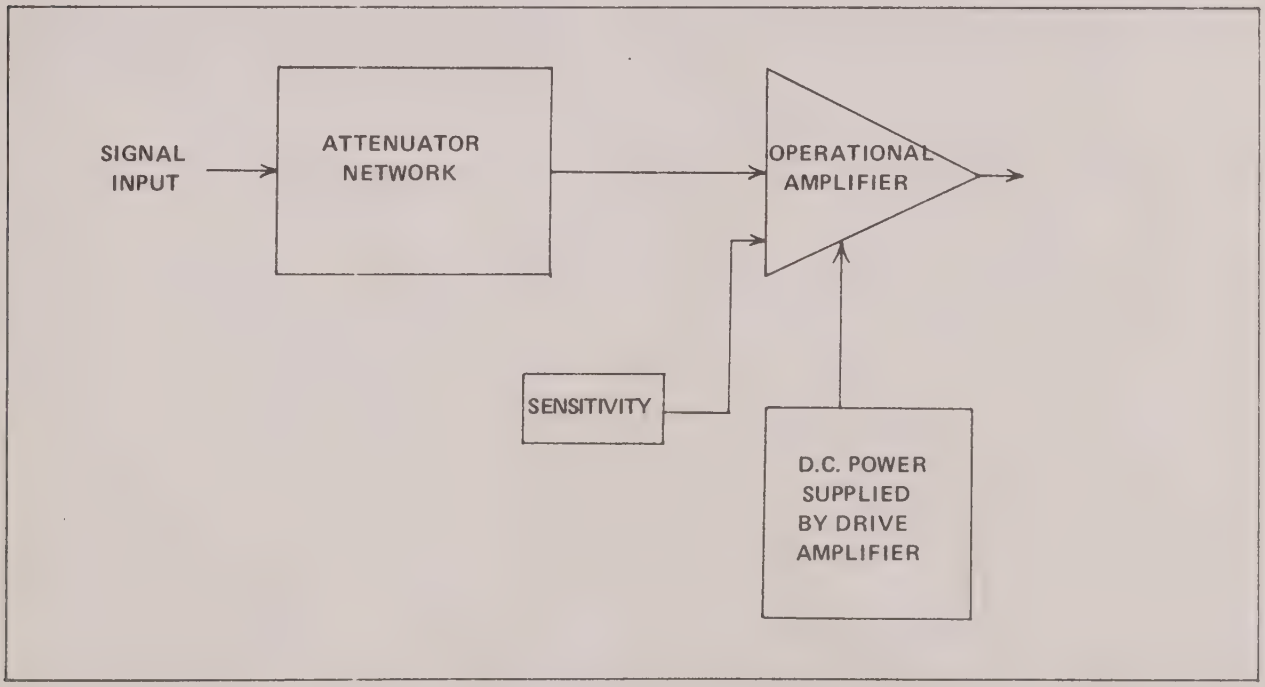


FIGURE 5-1 PREAMPLIFIER BLOCK DIAGRAM

SECTION VI

PARTS IDENTIFICATION

6.1 GENERAL

This unit has been accurately calibrated and adjusted before shipment from the factory and should give long, trouble-free service. For servicing beyond the scope of the instructions contained in this manual or the technical equipment available, contact your nearest ISD Service Engineer listed on the warranty card shipped with the unit.

The following parts lists and schematic diagrams are designed to assist in servicing and repairing the unit.

NOTE: Check to be sure the schematic number and revision letter stamped on the rear of the recorder agree with the number and revision letter on the schematic contained in this section.

To assure prompt and satisfactory delivery of replace parts, include the folloiwng with the purchase order:

1. Name, model number, and serial number of the instrument

   For example: Gould Preamplifier Assembly 892035 Serial Number. _____

2. Description of the part as listed in the manual.

3. Gould part number.

NOTE: Do not use the SYMBOL NUMBER from the parts list for identifying desired parts on the order.

EXPLODED VIEW PARTS LIST
PREAMPLIFIER ASSEMBLY
FIGURE 6-1

ITEM NUMBER	PART NUMBER	DESCRIPTION	SYMBOL NUMBER
	892035	Preamp Assy	
1	891859	Chassis Assy	
2	391856	Panel, Stand Off	
3	682962	Plate, Modified	
4	281996	Plate, Mounting (A-P for 3 & 4)	
	31-119920-4005	Screw, Flat Hd	
	31-119998-40	Nut, Hex	
	102855-1	Spacer	
		----- * -----	
5	882972	Switch Assy (See Fig. 6-2)	
6	281904	Insulator	
7	2-128693-1	Grommet, Caterpillar	
8	281902	Cover	
9	791855	Cover Assy, Top (A-P)	
	13-262716-6204	Screw, Self-Tap	
		----- * -----	
	292225	Insulation (Part of Item 8)	
10	234323	Conn., Receptacle-Male (A-P)	P-401 thru P-408
	31-119920-4006	Screw, Flat Hd	
	1-216741-411	Lockwasher	
		----- * -----	
	892025	Harness Assy	
11	292420	Strain, Relief, Clamp	
12	0-270155-1	Connector	P-203, P-204
13	265840-1	Terminal, Lug	
14	270153-1	Contact	
15	265760-1	Contact	
	892024	Harness Assy (A-P)	
	13-262716-4004	Screw, Self-Tap	
		----- * -----	
16	265840-1	Terminal Lug	
17	232997-23	Strap, Retaining	
18	234670-3	Terminal Lug	
19	265760-2	Contact	
20	265760-1	Contact	
21	2-128693-2	Grommet, Caterpillar	
22	240352-103	Capacitor	C-401 thru C-408
23	265840-1	Terminal Lug	
24	265814-12	Terminal Board (A-P)	TB-401, TB-402
	1-216741-420	Lockwasher, Spring	
	31-119918-6206	Screw,Mach	
		-----*-----	

EXPLODED VIEW PARTS LIST
PREAMPLIFIER ASSEMBLY
FIGURE 6-1 (Continued)

ITEM NUMBER	PART NUMBER	DESCRIPTION	SYMBOL NUMBER
25	291862	Spacer	
		(A-P)	
	1-216741-420	Lockwasher, Spring	
	31-119918-6204	Screw, Mach.	
		----- * -----	
26	281515-3	Support, Spacer	
27	281515-2	Support, Spacer	
28	282961	Holder, Preamp	
29	766409	Preamp Assy (See Fig. 6-3)	
30	282963	Cover, Preamp	
	792022	Harness Assy	
		(A-P)	
	13-262716-4004	Screw, Self-Tap	
		----- * -----	
31	234670-3	Terminal, Lug	
32	265760-1	Contact	
33	232997-23	Strap, Retaining	
34	265840-1	Terminal, Lug	
35	265760-2	Contact	
36	230076	Bumper, Rubber	
37	391857	Plate, Bottom	
		(A-P)	
	13-262716-6204	Screw, Self-Tap	
		----- * -----	
	892023	Harness Assy	
38	265760-1	Contact	
39	246393-202	Resistor, Var. W. Switch	R-410 thru R-418
40	891860	Panel Assy	
		(A-P)	
	243898-82	Nut Assy	
		----- * -----	
41	285651-3	Knob	
42	285652-2	Knob	
43	281515-7	Support, Spacer	

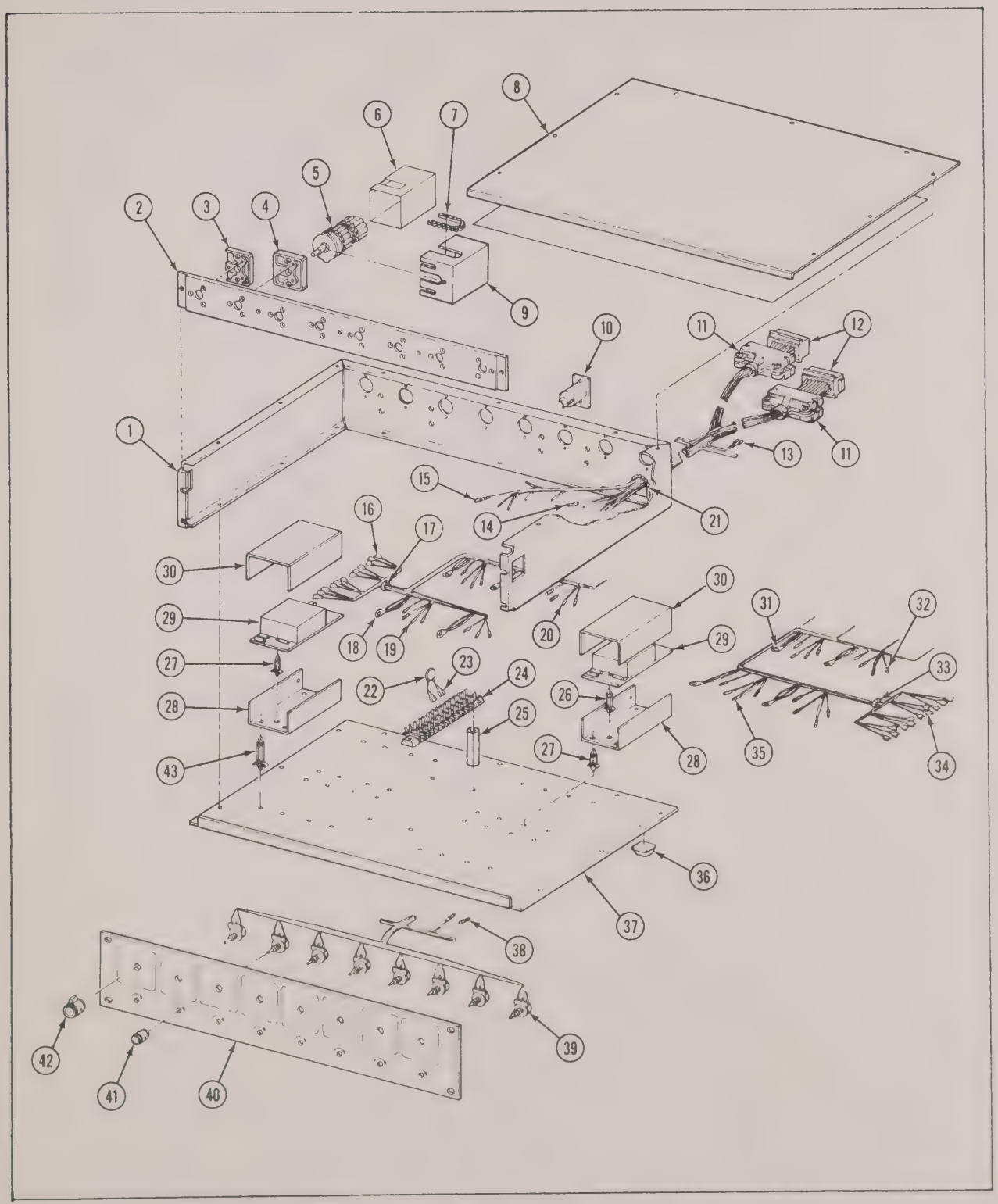


FIGURE 6-1 PREAMPLIFIER ASSEMBLY

EXPLODED VIEW PARTS LIST
SWITCH ASSEMBLY 882972
FIGURE 6-2

SYMBOL NUMBER	PART NUMBER	DESCRIPTION
R-101	50-128182-2504	Resistor
R-102	50-128182-1504	Resistor
R-103	50-128182-5003	Resistor
R-104	50-128182-2503	Resistor
R-105	50-128182-1503	Resistor
R-106	50-128182-5002	Resistor
R-107	50-128182-2502	Resistor
R-108	50-128182-1502	Resistor
R-109	50-128182-5001	Resistor
R-110	50-128182-2501	Resistor
R-111	50-128182-1501	Resistor
R-112	50-128182-5000	Resistor
R-113	50-128182-5000	Resistor
R-114	50-128182-2504	Resistor
R-115	50-128182-1504	Resistor
R-116	50-128182-5003	Resistor
R-117	50-128182-2503	Resistor
R-118	50-128182-1503	Resistor
R-119	50-128182-5002	Resistor
R-120	50-128182-2502	Resistor
R-121	50-128182-1502	Resistor
R-122	50-128182-5001	Resistor
R-123	50-128182-2501	Resistor
R-124	50-128182-1502	Resistor
R-125	50-128182-5000	Resistor
R-126	50-128182-5000	Resistor
S-101	281955	Switch

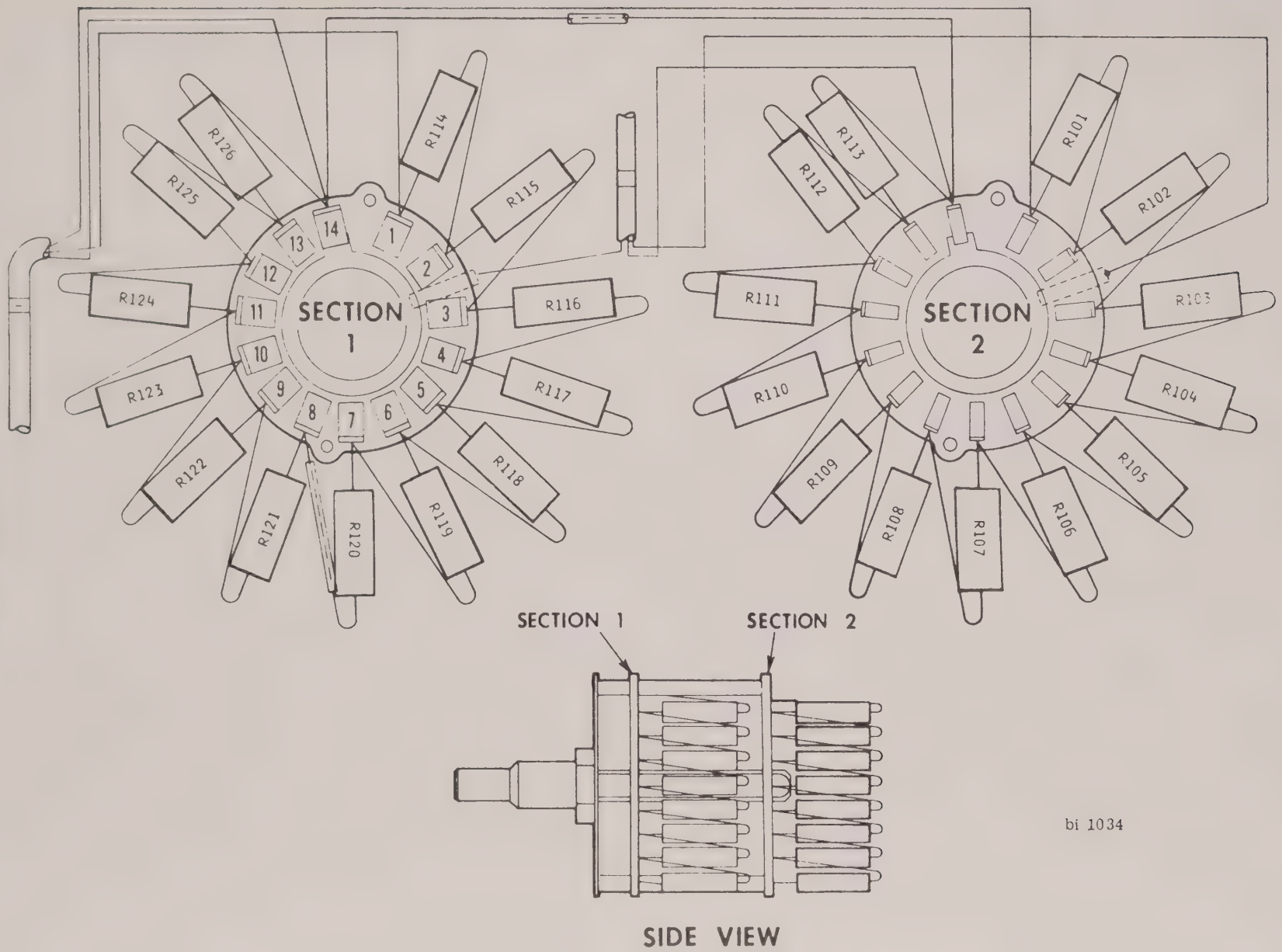


FIGURE 6-2 SWITCH ASSEMBLY 882972

EXPLODED VIEW PARTS LIST
PREAMPLIFIER ASSEMBLY 766409
FIGURE 6-3

SYMBOL NUMBER	PART NUMBER	DESCRIPTION
AR-401	266002	Transducer Amplifier
R-401	1-117802-5003	Resistor
R-402	1-117802-5003	Resistor
R-403	1-128182-1001	Resistor
R-406	266337-503	Resistor, Variable
R-407	5-115557-331	Resistor

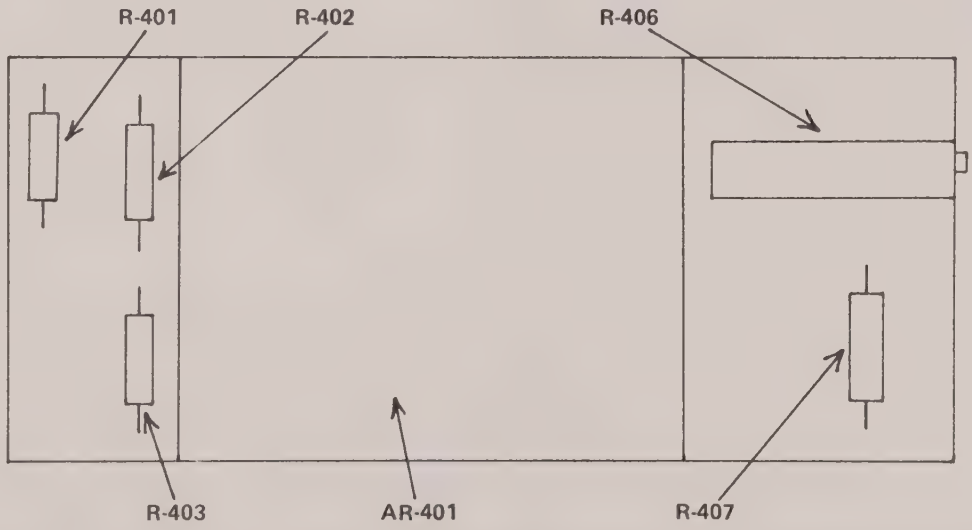
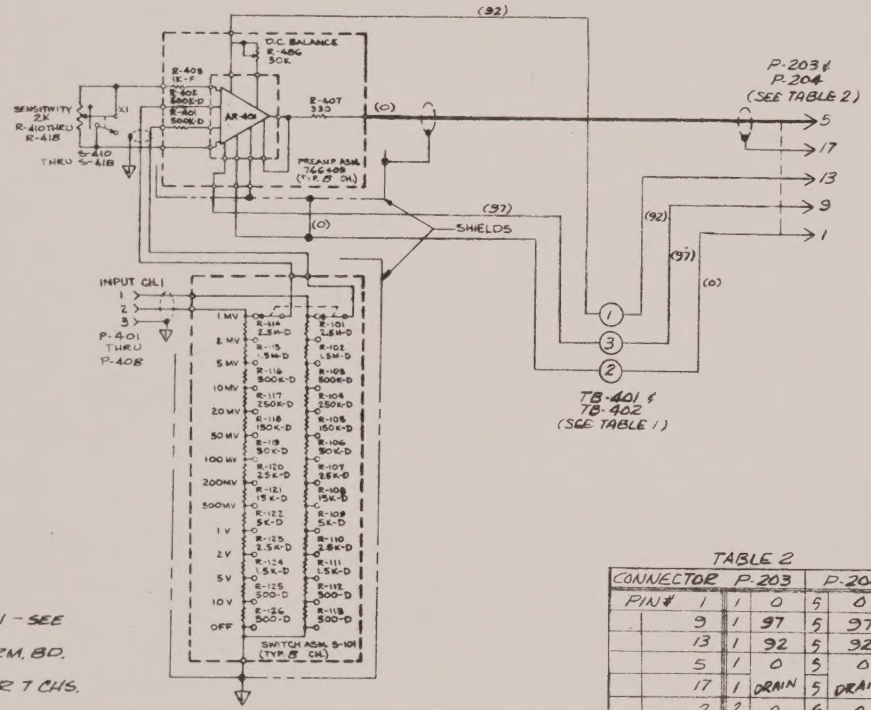


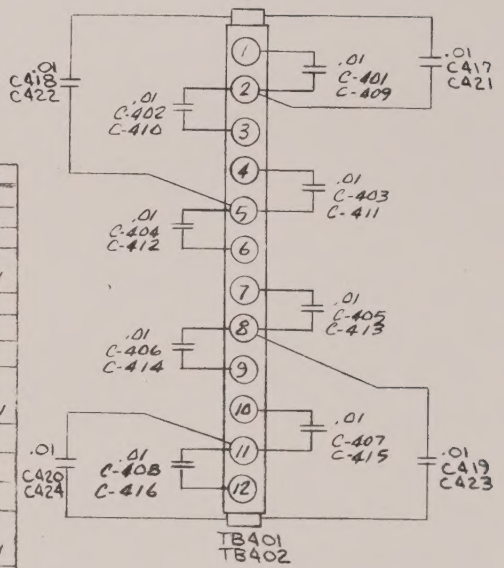
FIGURE 6-3 PREAMPLIFIER ASSEMBLY 766409

REPRO 283993 (PG 3)

REVISIONS		
SYM	DESCRIPTION	DATE
A-1	ADDED C417-C424 DCN 26410	RM 4/
B-1	REV'D SCHEMATIC PER DCN PER DCN 28292/ S. JONES	1-8-



TO RECORDER CHASSIS



CHANNEL NO. 1 SHOWN - SEE CHART BELOW FOR TERM. BD. CONNECTIONS OF OTHER 7 CHS.

TABLE 1

TERM. BD.		401		402	
CONTACT	1	1	92	5	92
	2	1	0	6	0
	3	1	97	5	97
	4	2	92	6	92
	5	2	0	6	0
	6	2	97	6	97
	7	3	92	7	92
	8	3	0	7	0
	9	3	97	7	97
	10	4	92	8	92
	11	4	0	8	0
CONTACT	12	4	97	8	97

WIRE COLOR
CH. NO.

TABLE 2

CONNECTOR		P-203		P-204	
PIN #	1	1	0	5	0
	9	1	97	5	97
	13	1	92	5	92
	5	1	0	5	0
	17	1	DRAIN	5	DRAIN
	2	2	0	6	0
	10	2	97	6	97
	14	2	92	6	92
	6	2	0	6	0
	18	2	DRAIN	6	DRAIN
	3	3	0	7	0
	11	3	97	7	97
	15	3	92	7	92
	7	3	0	7	0
	19	3	DRAIN	7	DRAIN
	4	4	0	8	0
	12	4	97	8	97
	16	4	92	8	92
	8	4	0	8	0
PIN #	20	4	DRAIN	8	DRAIN

WIRE COLOR
CH. NO.

PREAMPLIFIER ASSY., 892035

BY	DATE	NAME	SCHEMATIC
DR KLOSS	4/78		
CH	7/78		
APP KLOSS	7/78		

CODE IDENT 96795 ISSUE G

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DWG. NO. 291775

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